

27. (NEW) The synthetic oligonucleotide of claim 26, which recognizes and binds an allosteric site on DNA cytosine methyltransferase (DCMTase) thereby modulating DCMTase activity associated with the allosteric site.

28. (NEW) The synthetic oligonucleotide of claim 27, which inhibits DCMTase activity with an inhibition constant of not greater than 1000 nM.

29. (NEW) The synthetic oligonucleotide of claim 27, which inhibits DCMTase activity with an inhibition constant of not greater than 200 nM.

30. (NEW) The synthetic oligonucleotide of claim 27, which inhibits DCMTase activity with an inhibition constant of not greater than 20 nM.

31. (NEW) The synthetic oligonucleotide of claim 27, which comprises a nucleotide sequence selected from the group consisting of TGACGTCA and SEQ ID NOS: 1-4, 6-12, 14-15, 18-101, 103, 105, 107 and 109.

32. (NEW) The synthetic oligonucleotide of claim 27, wherein the DCMTase is from a mammal, bird, fish, amphibian, reptile, insect, plant or fungus.

33. (NEW) The synthetic oligonucleotide of claim 32, wherein the mammal is a mouse or a human.

34. (NEW) A synthetic oligonucleotide comprising a 5mCpG dinucleotide, wherein the 5mC is a C-5 methylcytosine, and wherein the synthetic oligonucleotide comprises a nucleotide sequence selected from the group consisting of SEQ ID NOS: 1, 2, 4, 6-8, 13, and 16-110.

35. (NEW) The synthetic oligonucleotide of claim 34, which recognizes and binds an allosteric site on DNA cytosine methyltransferase (DCMTase) thereby modulating DCMTase activity associated with the allosteric site.

36. (NEW) The synthetic oligonucleotide of claim 34, wherein the oligonucleotide is approximately 15 to approximately 70 nucleotides in length.
37. (NEW) The synthetic oligonucleotide of claim 34, wherein the oligonucleotide is approximately 15 to approximately 50 nucleotides in length.
38. (NEW) The synthetic oligonucleotide of claim 34, wherein the oligonucleotide is approximately 20 to approximately 30 nucleotides in length.
39. (NEW) The synthetic oligonucleotide of claim 34, wherein the oligonucleotide is approximately 30 nucleotides in length.
40. (NEW) The synthetic oligonucleotide of claim 34, which comprises a phosphorothioate, peptide nucleic acid (PNA), deoxyribonucleic guanidine (DNG), or ribonucleic guanidine (RNG) oligonucleotide.
41. (NEW) A synthetic oligonucleotide comprising a 5mCpG dinucleotide, wherein the 5mC is a C-5 methylcytosine, and wherein the nucleotide sequence of the synthetic oligonucleotide is a sequence selected from the group consisting of SEQ ID NOS: 1, 2, 4, 6-8, and 13-110.
42. (NEW) The synthetic oligonucleotide of claim 41, which comprises a phosphorothioate, peptide nucleic acid (PNA), deoxyribonucleic guanidine (DNG), or ribonucleic guanidine (RNG) oligonucleotide.
43. (NEW) A pharmaceutically acceptable salt of the synthetic oligonucleotide of claim 26.
44. (NEW) A pharmaceutically acceptable salt of the synthetic oligonucleotide of claim 34.
45. (NEW) A pharmaceutically acceptable salt of the synthetic oligonucleotide of claim 41.